CLAIMS

What is claimed is:

1. An imaging device, comprising:

a plurality of lenses mounted on a multi-dimensional support structure, wherein each lens in the plurality of lenses has a field of view;

a plurality of optical detectors corresponding to the plurality of lenses for capturing an optical signal from at least two lenses among the plurality of lenses;

means for combining the optical signal from at least two lenses; and

means for generating an image with at least one among a variable field of view and a variable resolution.

2. The imaging device of claim 1, wherein the means for combining and the means for generating comprises a processor.

3. The imaging device of claim 1, wherein the means for combining further comprises a substrate having circuitry thereon for image integration and processing of a plurality of output signals from the plurality of optical detectors.

4. The imaging device of claim 1, wherein the plurality of lenses comprises a plurality of photon sieve lenses.

5. The imaging device of claim 1, wherein the multi-dimensional support is formed substantially in the shape of at least one among a flat surface, a hemisphere, an elliptical shape, and a sphere.

6. The imaging device of claim 1, wherein each of the plurality of optical detectors comprises at least one among a charge coupled device and a complementary metal-oxide-semiconductor device.

7. The imaging device of claim 1, wherein the field of view for each lens in the plurality of lenses overlaps each other.

8. The imaging device of claim 2, wherein the processor is programmed to generate the image with a variable field of view and a variable resolution.

9. The imaging device of claim 1, wherein the plurality of lenses each comprises an array of sub-wavelength apertures and relief structures about each of the apertures of the array for enhanced transmission of light.

10. The imaging device of claim 1, wherein the plurality of lenses use diffractive optics.

11. An imaging device, comprising:

a plurality of lenses mounted on a multi-dimensional support structure, wherein each lens in the plurality of lenses has a field of view;

a plurality of optical detectors corresponding to the plurality of lenses for capturing an optical signal from at least two lenses among the plurality of lenses; and

a processor for combining the optical signal from at least two lenses to form an image and electronically controlling the field of view and a resolution of the image.

12. The imaging device of claim 11, wherein the plurality of lenses each comprises an array of sub-wavelength apertures.

13. The imaging device of claim 11, wherein the plurality of lenses comprises a plurality of photon sieve lenses.

14. The imaging device of claim 11, wherein the multi-dimensional support is formed substantially in the shape of at least one among a flat surface, a hemisphere, an elliptical shape, and a sphere.

15. The imaging device of claim 11, wherein each of the plurality of optical detectors comprises at least one among a charge coupled device and a complementary metal-oxide-semiconductor device.

16. The imaging device of claim 11, wherein the field of view for each lens in the plurality of lenses overlaps each other.

17. A method of forming a compound lens, comprising the steps of:

mounting a plurality of lenses on a multi-dimensional support structure, wherein each lens in the plurality of lenses has a field of view;

capturing an optical signal from at least two lenses among the plurality of lenses using a plurality of optical detectors corresponding to the plurality of lenses for

combining the optical signal from at least two lenses to form a single image; and

generating an image with at least one among a variable field of view and a variable resolution.

18. The method of claim 17, wherein the step of generating the image comprises the step of generating the single image with both the variable field of view and the variable resolution.

19. The method of claim 17, wherein the method further comprises the step of electronically controlling the field of view and the resolution of the compound lens.

20. The imaging device of claim 17, wherein the plurality of lenses use diffractive optics.